

H110735

NOAA FORM 76-35A

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SERVICE

DESCRIPTIVE REPORT

Type of Survey Hydrographic
Field No. RA-10-5-97
Registry No. H-10735

LOCALITY

State Alaska
General Locality Northern Stephens Passage
Sublocality Approaches to Oliver Inlet

1997

CHIEF OF PARTY
CAPT Alan D. Anderson, NOAA

LIBRARY & ARCHIVES

DATE MAR 27 1998

HYDROGRAPHIC TITLE SHEET

H-10735

INSTRUCTIONS - The Hydrographic Sheet should be accompanied by this form,
filled in as completely as possible, when the sheet is forwarded to the Office.

FIELD NO.

RA-10-5-97

State Alaska

General locality Northern Stephens Passage

Locality Approaches to Oliver Inlet

Scale 1:10,000 Date of survey April 3 to April 27, 1997

Instructions dated 12/30/96, Change #1 4/3/97 Project No. OPR-0328-RA

Vessel RA-1(2121), RA-2(2122), RA-3(2123), RA-4(2124), RA-5(2125), RA-6(2126)

Chief of party CAPT Alan D. Anderson, NOAA

Surveyed by NOAA Ship RAINIER Personnel

Soundings taken by echo sounder, ~~and lead, pole~~ DSF-6000N, EG&G Side Scan Sonar, Model 260

Graphic record scaled by RAINIER Personnel

Graphic record checked by RAINIER Personnel

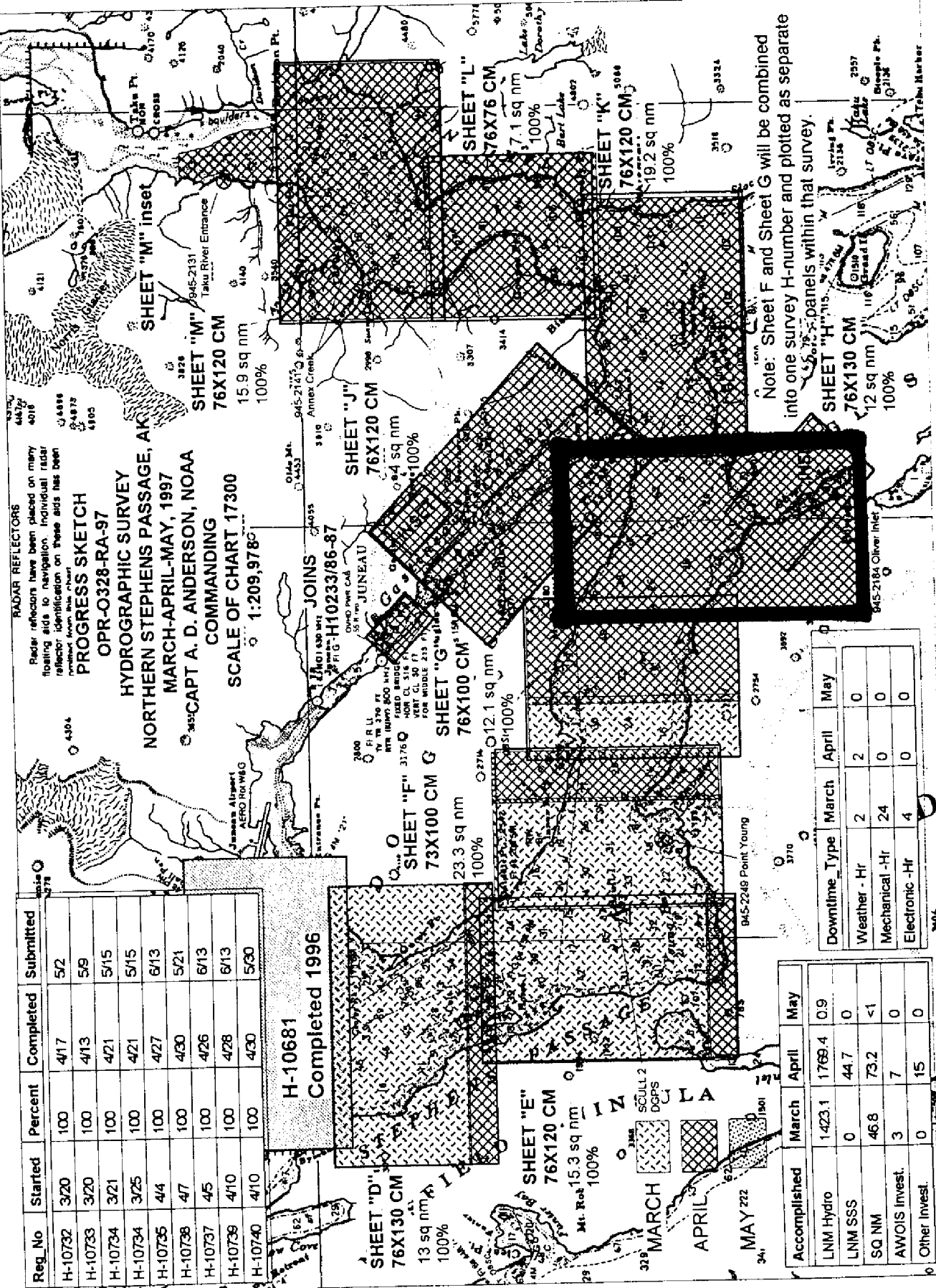
Evaluation by: B. Mihailov Automated plot by HP Design Jet 650C

~~Drawn by~~ Verification by E. Domingo

Soundings in fathoms ~~feet~~ at MLW MLLW and tenths

REMARKS: All times are UTC, revisions and marginal notes in black were
generated during office processing. All separates are filed with
the hydrographic data, as a result page numbering may be interrupted
or non-sequential. All depths listed in this report are referenced
to mean lower low water unless otherwise noted.

Awois and SURF ✓ RWD 2/98



RADAR REFLECTORS
 Radar reflectors have been placed on many floating aids to navigation. Individual radar reflector identification on these aids has been provided from this chart.

OPR-0328-RA-97
HYDROGRAPHIC SURVEY
NORTHERN STEPHENS PASSAGE, AK
MARCH-APRIL-MAY, 1997
COMMANDING OFFICER
CAPT A. D. ANDERSON, NOAA
SCALE OF CHART 17300
1:209,978

Reg. No	Started	Percent	Completed	Submitted
H-10732	3/20	100	4/17	5/2
H-10733	3/20	100	4/13	5/9
H-10734	3/21	100	4/21	5/15
H-10734	3/25	100	4/21	5/15
H-10735	4/4	100	4/27	6/13
H-10738	4/7	100	4/30	5/21
H-10737	4/5	100	4/26	6/13
H-10739	4/10	100	4/28	6/13
H-10740	4/10	100	4/30	5/30

H-10681
Completed 1996

Reg. No	Started	Percent	Completed	Submitted
SHEET "D"	13 sq nm	100%		
SHEET "E"	15.3 sq nm	100%		
SHEET "F"	23.3 sq nm	100%		
SHEET "G"	12.1 sq nm	100%		
SHEET "H"	12 sq nm	100%		
SHEET "I"	12 sq nm	100%		
SHEET "J"	9.4 sq nm	100%		
SHEET "K"	19.2 sq nm	100%		
SHEET "L"	17.1 sq nm	100%		

Accomplished	March	April	May
LNM Hydro	1423.1	1769.4	0.9
LNM SSS	0	44.7	0
SQ NM	46.8	73.2	<1
AWOIS Invest.	3	7	0
Other Invest.	0	15	0

Downtime Type	March	April	May
Weather - Hr	2	2	0
Mechanical -Hr	24	0	0
Electronic -Hr	4	0	0

Note: Sheet F and Sheet G will be combined into one survey H-number and plotted as separate 15.3 sq nm panels within that survey.

Descriptive Report to Accompany Hydrographic Survey H-10735

Field Number RA-10-5-97

Scale 1:10,000

April 1997

NOAA Ship RAINIER

Chief of Party: Captain Alan D. Anderson, NOAA

A. PROJECT ✓

This hydrographic survey was completed as specified by Project Instructions OPR-O328-RA dated December 20, 1996 and Change No. 1 to Project Instructions OPR-O328-RA dated April 3, 1997. Survey H-10735 corresponds to sheet H as defined in the sheet layout. This survey will provide contemporary hydrographic survey data as part of a continuing program to improve chart coverage of the Inside Passage in southeast Alaska. Requests for hydrographic surveys and updated charts in this area have been received from the United States Coast Guard (USCG), Southeastern Alaska Pilot's Association (SEAPA), the Alaska Department of Transportation, and the Alaska Department of Environment and Conservation in support of cruise line, commercial fishing, mining, and logging industries.

B. AREA SURVEYED *See Evaluation Report, Section B.*

The survey area is in Northern Stephens Passage in the approaches to Oliver Inlet. The survey's northern limit is the shoreline of Douglas Island and the southern limit is the shoreline of Admiralty Island. The survey's western limit is longitude $134^{\circ} 23' 45''$ W and the eastern limit is $134^{\circ} 16' 15''$ W. Data acquisition was conducted from April ~~1~~³ to April 27, 1997.

C. SURVEY VESSELS ✓

Data were acquired by RAINIER and her survey launches as noted in the Survey Information Summary ~~included with this report.~~

D. AUTOMATED DATA ACQUISITION AND PROCESSING ✓

All data were acquired and processed using the Hydrographic Data Acquisition and Processing System (HDAPS.) The final field sheet was generated using MapInfo (Version 4.1) and MapBasic software developed by N/CS32 and modified by Rainier personnel. A complete listing of software for HDAPS is included in Appendix VI. *

E. SONAR EQUIPMENT ✓

Side scan sonar (SSS) operations were conducted using an EG&G model 260 slant-range corrected SSS recorder (S/N 0012106) and an EG&G 272-T-dual channel towfish (S/N 016989). The towfish was operated on the 100 kHz frequency.

The SSS towfish was towed with a 70 meter EG&G lightweight tow cable. The towfish was deployed manually on the starboard quarter of launch 2125, attached to the aft fall shackle by line and lead around the stern railing. The length of towcable deployed was determined by noting the measured markings on the towfish cable as these markings met the stern railing. The SSS towfish was adjusted to maintain a height off the bottom of 8 to 20 percent of the range scale. The 100- and 150-meter range scales were used. SSS operations were conducted at or less than 3 knots.

* Filed with the hydrographic data.

Two hundred percent SSS collection was conducted over the pre-survey review item identified for chart 17315, dated January 4, 1997, and common to H-10735. Degraded sonograms were rejected and rerun. A swath plot depicting SSS bottom coverage indicates that 200% SSS coverage was completed over a 200-meter radius. The recorder gain setting was adjusted for the best return for changing bottom conditions. A rub test was successfully conducted prior to operating the SSS. *See Section N, Item Investigations, hydrographers report, for discussion of wire drag grounding of 25 feet.*

Side scan sonograms were manually scanned for significant contacts in accordance with section 7.3.2 of the project instructions, a few contacts of note were identified and entered into a HDAPS contact table. ~~A subsequent echosounder development determined the contacts to be an extension of the charted reef to the southeast, but at a greater depth than the charted PSR item.~~

Multi-beam echo sounder equipment was not used on this survey. *Concur*

F. SOUNDING EQUIPMENT ✓

The Raytheon DSF-6000N is a dual frequency (100 kHz, 24 kHz), paper trace echo sounder. Serial numbers are included on the headers of the daily Raw Master Printouts. **No problems that affect survey data were encountered. All DSF-6000N soundings were acquired in meters using the High + Low, high frequency digitized setting.*

G. CORRECTIONS TO ECHO SOUNDINGS ✓

Two sound velocity casts were used for this survey. Information on the casts is included in the Survey Information Summary report.

The sound velocity casts were acquired with SBE SEACAT Profiler (S/N 219), calibrated December 15, 1996. Velocity correctors were computed using the PC programs SEACAT and VELOCITY, version 3.3, 1996), in accordance with Hydrographic Survey Guideline (HSG) No. 69. A printout of the Sound Velocity Corrector Table used in the HDAPS Post Survey program is included in the "Separates to be Included with Survey Data, IV. Sounding Equipment Calibrations and Corrections". ***

A static transducer depth was determined using FPM Fig 2.2 for vessels 2121-2126 in the spring of 1997. Settlement and squat correctors were computed in accordance with Hydrographic Manual Section 4.9.4.2., using FPM Fig. 2.3, and are included with project data for OPR-O328-RA. The data for vessels 2121, 2122, and 2123, were collected in Shilshole Bay, Washington during the spring of 1997; no changes to the configuration of vessels 2124 and 2126 have occurred since they were measured at the same location in the spring of 1996. The data for vessel 2125 were collected near Scull Island, Alaska in March 1997. All offset tables contain offsets for the GPS antenna, as well as static draft measurements, and settlement and squat data. ***

Offset tables **1-6* correspond to the last digit of the vessel number. Offset table 7 is for RAINIER. The offset tables are included with project data for OPR-O328-RA. The launches are not equipped with heave, roll and pitch sensors.

The Coastal and Estuarine Oceanography Branch (N/OES334), through N/CS31, provided predicted tides for the project on diskette for the Juneau, Alaska reference station (945-2210). HDAPS listings of the data used in generating tide corrector tables are included in Appendix V of this report. Tidal correctors as provided in the project instructions for H-10735 are provided in the Survey Information Summary included with this report.

Juneau, Alaska (945-2210) and Ketchikan, Alaska (945-0460) are the primary control stations for datum determination. RAINIER personnel installed Sutron 8200 tide gages at Point Young (945-2249) on March 19th, 1997 and at Oliver Inlet (945-2184) on April 6th, 1997, and the gages were removed on May 15th and April 17th, 1997 respectively. Refer to the Field Tide Notes and supporting data in Appendix V **for individual*

** Filed with the hydrographic data*
OPR-O328

H-10735

RA-10-05-97

gage performance and level closure information. This information has been forwarded to N/OES212 in accordance with HSG 50 and FPM 4.3. A request for approved tides was forwarded to N/OES23 at the completion of the project. *Approved tide note is attached to this report dated September 11, 1997*

The tidal cycle in Oliver Inlet is influenced by the water level in Stephens Passage, but is distinctly different than the predicted tides at Juneau. For instance, a strong current was observed flowing out of Oliver Inlet 30 minutes after the predicted low tide for Juneau. The correctors applied in Stephens Passage allow for a height difference from Juneau, but not a time difference. The raw tide gage data from Oliver Inlet and Point Young indicate a time delay inside Oliver Inlet of 20 minutes between highs outside the inlet and 3 hours for low tides.

The hydrographer recommends that zoning for Oliver Inlet change at the southern extent of the narrow channel connecting it to Stephens Passage because it restricts the flow out of the Inlet on falling tides. *Reference Correspondence attached to this report.*

H. CONTROL STATIONS *See Eval Report, Section H.*

The horizontal datum for this project is NAD 83. The control stations used for this survey are listed in ~~Appendix III~~ *this report*. See the OPR-0328-RA-97 Horizontal Control Report for more information.

I. HYDROGRAPHIC POSITION CONTROL *See Eval Report, Section I.*

All soundings were positioned using differential GPS. Primary control was the VHF differential reference station at SCULL 2. The US Coast Guard Beacon at GUSTAVUS and a VHF differential reference station at CIRCLE were used as backup. Launch-to-launch DGPS performance checks were performed in accordance with Section 3.4.4 of the FPM. Two observations of position were made from two different DGPS base stations, SCULL 2 and GUSTAVUS, while the launches were rafted together with their GPS antennae within 2-3 meters of each other. RAINIER also used SHIPDIM, version 2.2R (April 1996) with a Trimble Centurion P-code receiver and an Ashtech sensor (both differentially-corrected) to monitor the performance of the reference stations. SCULL 2 was compared to GUSTAVUS at least once a week while installed. Some outliers were noted, but none indicated systematic or continuous errors in either the GUSTAVUS beacon or the VHF station at SCULL 2. The SHIPDIM OUTLIER.SUM results are included in the project data for OPR-0328-RA.

J. SHORELINE *See Eval Rpt., Section J*

The shoreline manuscript from Coastal Mapping survey CM-8904 was supplied by N/CS341 in Standard Digital Data Exchange Format (SDDEF). The digital files from DM-10046 through DM-10051 were projected to the survey grid with OPR-0328-RA-97 geodetic parameters using program Shore version 2.0, provided by N/CS32, and plotted on the survey using HDAPS. *DM-10051 and DM-10046 apply to this survey.*

Limited shoreline verification was conducted in accordance with the Project Instructions. For this survey the general limit of safe navigation of a survey launch is 5-50 meters offshore of apparent low tide, with the exception of Oliver Inlet, where the entrance is not navigable at low tide. Water depths along this limit of safe navigation are generally 3-5 meters at Mean Lower Low Water. Features shown inshore of the NALL are the hydrographer's representation of the shoreline while slowly transiting along the shore, and are intended to aid chart compilation.

Shoreline manuscript and field features, except for Oliver Inlet, were compared to an enlargement of chart 17315, plotted by RAINIER personnel, as well as digital overlay of data on the chart image in MapInfo. Oliver Inlet shoreline manuscript and field features were compared to prior surveys H-1924 and H-1898, which included much more detail and were just as accurate as the manuscript. Charted features matched the shoreline as observed during the current survey except for the following. *Concur*

Charted Feature	Geographic Position	Observed Feature
Rock	58° 11' 31" N 134° 16' 42" W • 58° 12' 19" N 134° 22' 01" W • 58° 12' 47" N 134° 23' 12" W • 58° 12' 59" N 134° 23' 48" W • 58° 09' 04" N 134° 17' 04" W • 58° 07' 29" N 134° 19' 15" W • 58° 08' 46" N 134° 20' 25" W •	Rock Ledge
Rocks <i>Ledge</i>	58° 11' 38" N 134° 17' 55" W • 58° 11' 41" N 134° 19' 22" W •	Rock Ledge
Rock Ledge	58° 11' 50" N 134° 20' 05" W • 58° 12' 03" N 134° 21' 10" W •	Ledge is North of charted position
None	58° 12' 14" N 134° 21' 42" W • 58° 12' 33" N 134° 22' 29" W • 58° 09' 14" N 134° 16' 22" W • 58° 08' 57" N 134° 18' 45" W •	Rock Ledge
Rock Ledge	58° 09' 15" N 134° 21' 30" W •	Ledge is larger than charted, extends more easterly and westerly
Rocks	58° 09' 06" N 134° 21' 12" W •	Rock & Gravel bar leading to charted ledge

Charted ledge extended based on hydro information. Notation added to Smooth sheet.

Also, one charted cultural feature, the small boat portage in Oliver Inlet, was not found at the charted position. The actual geographic position of the portage is 58° 06' 16" N 134° 18' 24" W. *This feature is on chart 17300 27th Ed.*

Shoreline manuscript features matched the shoreline as observed during the current survey except for the following.

Shoreline Manuscript Feature	Geographic Position	Observed Feature
Rock	58° 08' 58" N 134° 16' 35" W •	Bow of charted wreck
Rock	58° 06' 49" N 134° 19' 12" W •	Rock Pile
1 rock	58° 11' 32" N 134° 17' 28" W	Rock not found after 5 minute visual search at low water, 2-10 meter depths, 8 meter visibility, and 10 meter line spacing
1 rock	58° 11' 30" N 134° 17' 05" W	Rock not found at low water, 2-10 meter depths, 8 meter visibility, and 10 meter line spacing

*Wreck limits shown to scale on Smooth sheet. Depicted as ledge with high point. * (9) **
Feature is part of ledge as found on Smooth sheet.
Rock has not been shown on the Smooth sheet.

The charted shoreline should be revised using the manuscript shoreline and fieldwork notes as recorded in the MapInfo digital file named "Shoreline Remarks" within the bounds of the survey. *Data and remarks were analyzed during office processing and shown on the Smooth sheet as warranted.*

K. CROSSLINES ✓

Crosslines agreed within 1 meter with mainscheme hydrography. There was a total of 26.12 nautical miles of crosslines, comprising 11.1% of mainscheme hydrography.

L. JUNCTIONS See Eval Report, Section L.

The following contemporary surveys junction with survey H-10735.

Junction	Survey	Field Number	Scale
Western Limit	H-10734 ^b	RA-10-04-97	1:10,000
Eastern Limit	H-10737	RA-10-06-96	1:10,000

Soundings on these surveys were found to be in good agreement. Final comparisons will be made at the Pacific Hydrographic Branch (PHB) after reduction to final vertical datum.

M. COMPARISON WITH PRIOR SURVEYS See Eval Rpt, section M.

Prior surveys covering this survey area are as follows:

Prior Survey *	Scale	Date
H-1924 *	1:10,000	1888
H-1898 *	1:10,000	1888
H-4147WD *	1:40,000	1920-1921
H-4147-AWD *	1:40,000	1920-1921
H-3987WD	1:20,000	1917

* Additional surveys are listed in Eval Rpt., Section M.

Most prior survey soundings were found to be in fair agreement with those from the current survey. Least depths from the current survey were more shoal or in agreement with prior surveys. *Concur*

Differences between the current survey and priors can probably be attributed to scale and improved modern positioning and sounding equipment. Final comparisons will be done at PHB after reduction to final sounding datum using tidal information collected concurrently with this survey.

N. ITEM INVESTIGATIONS ✓

There were no AWOIS items assigned for survey H-10735. However, RAINIER personnel identified a charted 4-3/4 fathom sounding as worthy of investigating.

Item Investigation

AWOIS #: N/A	DN: 094/096
CHART #: 17315 (1:40,000, 21 st Edition, 8/3/91)	VESNO: 2124/2122
ITEM DESCRIPTION: 4-3/4 fathom sounding from H-4147WD; appears to be a grounding (<i>Concur</i>)	
SOURCE: Chart 17315	

Geographic Position

	LATITUDE	LONGITUDE	POSITION #
CHARTED:	58° 09' 29" N	134° 21' 56" W	
OBSERVED:	58° 09' 33.499" N	134° 21' 50.838" W	40254+5
POSITIONED BY:	DGPS	DATUM:	MLLW (NAD 83)
METHOD OF INVESTIGATION: 200% side scan sonar. Five-meter echosounder development.			
FINDINGS: Echosounder development on DN 094 determined a least depth of 6.3 fm (11.3 m). It is likely that the wire drag grounding position was in error, given the direction of travel and the scale of the survey.			

Charting Recommendations

The hydrographer recommends removing the 4-3/4 fathom sounding at the charted position and charting the soundings found during this survey. - Concur, chart Gfms 2ft at survey position listed above.

O. COMPARISON WITH THE CHART See Eval Rpt., section O.

This survey was compared in the field to features portrayed on the following charts:

Chart	Scale	Edition Number	Date	Datum
17315	1:40,000	21 st	August 3, 1991	NAD 83
17300	1:209,978	27 th	August 14, 1993	NAD 83

Comparison of charted soundings with the survey is described in Section M, Comparison with Prior Surveys, and requires no further discussion. Non-sounding features are discussed in Section J. Final sounding comparisons will be made at PHB after reduction to final vertical datum.

Dangers to Navigation ✓

No dangers to navigation were discovered during the survey and none reported to the Seventeenth Coast Guard District for this survey. Concur No dangers to navigation were noted during office processing.

P. ADEQUACY OF SURVEY

Survey H-10735 is complete and adequate to supersede prior soundings and features in their common areas. Concur

Q. AIDS TO NAVIGATION ✓

No aids to navigation are present on survey H-10735. There are two significant landmarks, which are of use in radar navigation. The first is Icy Point, which is a prominent feature 0.62 nautical mile west of Point Tantallon. The second landmark is the concave aspect of the entrance to Oliver Inlet. Both of these features are useful in assisting a navigator to locate his position. Concur

R. STATISTICS ✓

Statistics are listed in the Survey Information Summary included with this report. *

S. MISCELLANEOUS ✓

Bottom samples were collected and sent to the Smithsonian in accordance with Project Instructions. One

* Filed with the hydrographic data.

unusual tidal current was found during this survey, in the entrance channel to Oliver Inlet. The entrance channel resembles a white water rapid with an estimated 6-knot current flowing in the direction of the tide. *Evaluator recommends that the Marine Chart Division consider a note be placed near Oliver Inlet to alert the mariner of this condition.*
T. RECOMMENDATIONS ✓

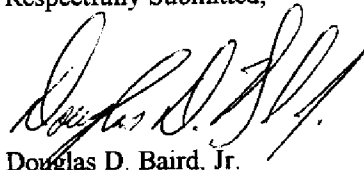
The hydrographer recommends removal of the wire drag green tint from the charts common to this survey. The wire drag tint without wire depth now confuses the mariner with non-bathymetric information. This information was useful when most soundings were derived from sparse leadline surveys. Modern surveys such as this one supercede wire drag clearances and hangs, prior survey soundings, and features seaward of the launch navigational limit by investigating, with high-percentage echosounder coverage, diver, side scan or visual investigation, all shoals and features that may pose a hazard to navigation. - CONCUR

U. REFERRAL TO REPORTS ✓

The following supplemental reports contain additional information relevant to this survey:

<u>Title</u>	<u>Date Sent</u>	<u>Office</u>
OPR-O328-RA Horizontal Control Report	June 1997	N/CS34
OPR-O328-RA 1997 Coast Pilot Report	June 1997	N/CS26
Project related data for OPR-O328-RA	June 1997	N/CS34
Secchi Disk Observations for OPR-O328-RA	June 1997	N/CS31

Respectfully Submitted,



Douglas D. Baird, Jr.
Lieutenant, NOAA

Approved and Forwarded,



Alan D. Anderson
Captain, NOAA
Commanding Officer

CONTROL STATIONS as of 24 Apr 1997 ✓

No	Type	Latitude	Longitude	H	Cart	Freq	Vel	Code	MM/DD/YY	Station Name
1	F	058:31:42.000	134:56:00.000	0	0	0.0	0.0		03/01/92	POUNDSTONE LIGHTLIST
2	F	058:31:42.860	134:56:03.680	0	0	0.0	0.0		03/01/92	POUNDSTONE HOAPS
3	F	058:30:16.042	134:52:09.349	2	250	0.0	0.0		03/20/96	GULL
4	F	058:17:04.466	134:44:25.552	0	0	0.0	0.0		04/05/97	COLT ISLAND LT LL#23792
5	F	058:18:55.499	134:42:02.285	0	0	0.0	0.0		04/05/97	GEORGE RK LT LL#23795
6	F	058:25:06.000	135:41:48.000	0	250	0.0	0.0		03/01/97	GUSTAVUS DGPR ID#892
7	F	058:12:16.867	134:38:44.450	6	250	0.0	0.0		03/01/97	SKULL DGPS
8	F	058:09:29.640	134:10:36.025	0	0	0.0	0.0		03/01/97	PT. ARDEN LT LL#23655
9	F	058:07:12.193	134:04:56.697	0	250	0.0	0.0		03/01/97	CIRCLE DGPS

APPROVAL SHEET

for


H-10735

Standard field surveying and processing procedures were followed in producing this examination in accordance with the Hydrographic Manual, Fourth Edition; the Hydrographic Survey Guidelines; and the Field Procedures Manual, as updated for 1994.

The digital data and supporting records have been reviewed by me, are considered complete and adequate for charting purposes, and are approved. All records are forwarded for final review and processing to N/CS34, Pacific Hydrographic Branch.

DATE: June 12, 1997

Approved and Forwarded,


Alan D. Anderson
Captain, NOAA
Commanding Officer
NOAA Ship RAINIER



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Office of Ocean and Earth Sciences
Silver Spring, Maryland 20910

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: September 11, 1997

HYDROGRAPHIC BRANCH: Pacific

HYDROGRAPHIC PROJECT: OPR-0328-RA

HYDROGRAPHIC SHEET: H-10735

LOCALITY: Northern Stephens Passage, AK. (Sheet H)

TIME PERIOD: April 3 - April 27, 1997

TIDE STATION USED: 945-2184 Oliver Inlet, AK.
Lat. $58^{\circ} 06.5'N$ Lon. $134^{\circ} 18.6'W$
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 2.648 meters

TIDE STATION USED: 945-2249 Young Bay, AK.
Lat. $58^{\circ} 11.0'N$ Lon. $134^{\circ} 35.2'W$
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 4.690 meters

REMARKS: RECOMMENDED ZONING

Use zone(s) identified as: SEA4B, SEA4C & SEA4D
Refer to attachments for zoning information.

Note 1: Provided time series data are tabulated in metric units
(Meters), relative to MLLW and on Greenwich Mean Time.



Note 2:

Juneau, AK was used as control for datum determination for all subordinate tide stations for this survey. Relative sea level trends show that the areas of Juneau Alaska are undergoing continual uplift. The relative sea level trend observed at Juneau for the time period 1950 through 1993 is -0.0114 m/yr. with a standard error of 0.0005 m/yr. As a result of high rate of sea level change, the 1960 to 1978 Tidal Epoch value of Mean Lower Low Water (MLLW) used as chart datum and reference datum for NOS tidal predictions does not reflect present conditions. The data are under review to determine an updated value of MLLW. An interim value was computed for Juneau, based on the series of data from 1989 to 1991 and controlled by the 1960-1978 Epoch datums at Ketchikan which is more stable. The provided values adjust the chart datum to a more realistic level and in a direction that is more conservative for navigation purposes.

Note 3:

The shoal areas of Oliver Inlet, the zone identified as "SEA4C", exhibit different tidal characteristics than areas north of it in Stephens Passage. The effects of drastically changing bathymetry followed by extremely shoal areas, result in extreme phase lags during the falling tide combined with a reduced tide range. The characteristics are assumed to be uniform within the entire zone, although this cannot be proven without additional tide stations. The mean tide range (Mn) at Oliver Inlet was computed to be 2.594 meters. The range at Young Bay is significantly higher at 4.207 meters. Only water level data from Oliver Inlet (945-2184) should be used to reduce soundings in zone "SEA4C" to MLLW.



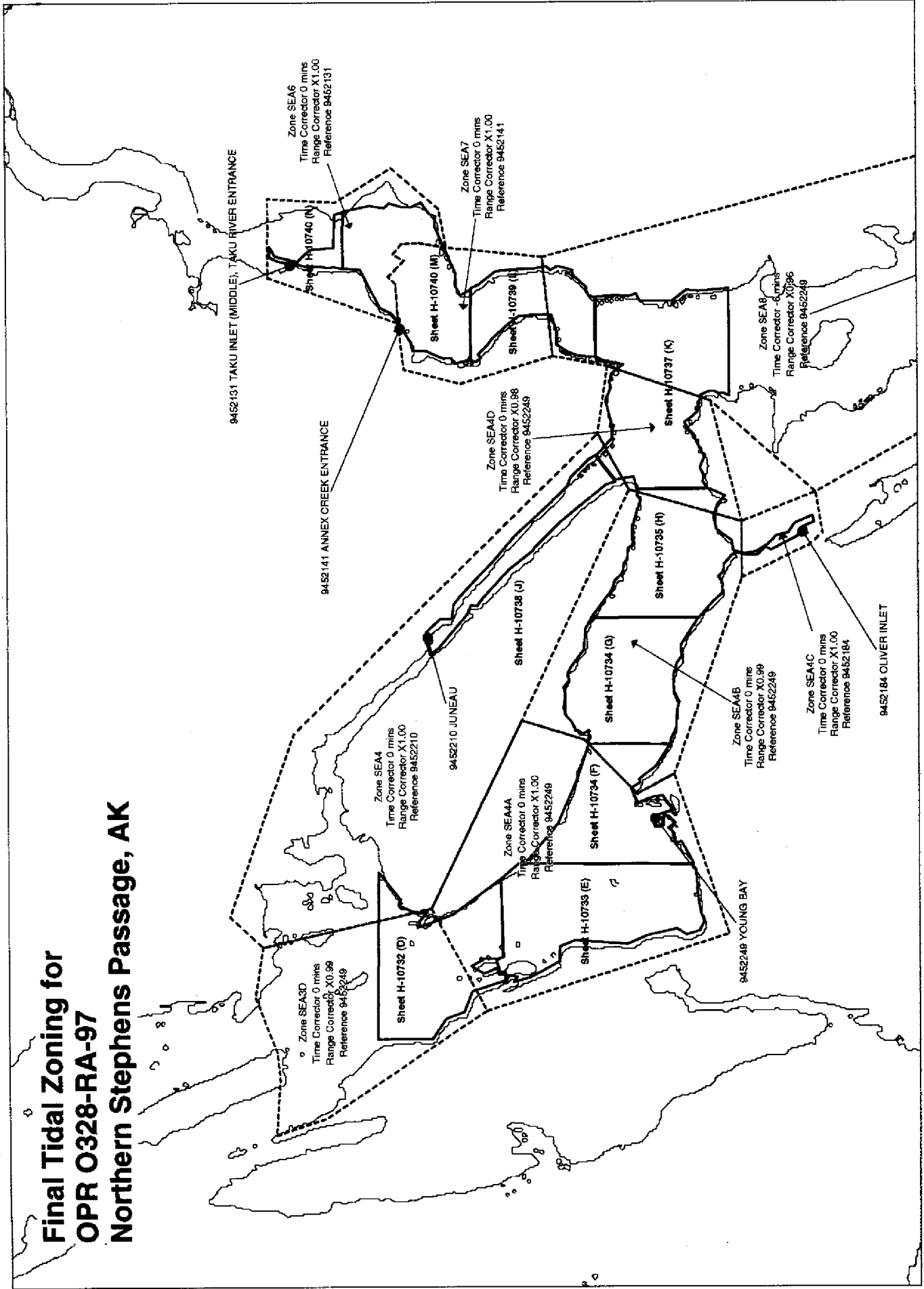
CHIEF, TIDAL ANALYSIS BRANCH

Final tide zone node point locations for OPR O328-RA-97,
Sheet H-10735 (H).

Format: Longitude in decimal degrees (negative value denotes
Longitude West),
Latitude in decimal degrees
Tide Station (in recommended order of use)
Average Time Correction (in minutes)
Range Correction

		Tide Station Order	AVG Time Correction	Range Correction
Zone SEA4B				
-134.563302	58.193104	945-2249	0	0.99
-134.544003	58.174283			
-134.355095	58.139807			
-134.300514	58.139749			
-134.269583	58.196589			
-134.49203	58.251071			
-134.510592	58.219749			
-134.563302	58.193104			
Zone SEA4C				
-134.355095	58.139807	945-2184	0	1.00
-134.300514	58.139749			
-134.272032	58.10242			
-134.311938	58.098954			
-134.323554	58.105589			
-134.355095	58.139807			
Zone SEA4D				
-134.15	58.207113	945-2249	0	0.98
-134.215162	58.212147	945-2210	0	0.98
-134.269583	58.196589			
-134.300514	58.139749			
-134.183573	58.155284			
-134.15	58.207113			

Final Tidal Zoning for OPR 0328-RA-97 Northern Stephens Passage, AK



GEOGRAPHIC NAMES

H-10735

Name on Survey	ON CHART NO. 17315, 17300 OR PREVIOUS SURVEY NO.									
	A	B	C	D	E	F	G	H	K	
	CON U.S. QUADRANGLE MAPS FROM LOCAL INFORMATION ON LOCAL MAPS P.O. GUIDE OR MAP RAND McNALLY ATLAS U.S. LIGHT LIST									
ALASKA (title)	X		X							1
ADMIRALTY ISLAND	X		X							2
DOUGLAS ISLAND	X		X							3
GREEN COVE	X		X							4
ICY POINT	X		X							5
OLIVER INLET	X		X							6
STEPHENS PASSAGE	X		X							7
										8
										9
										10
										11
										12
										13
										14
										15
										16
										17
										18
										19
										20
										21
										22
										23
										24
										25

Approved

Chris G. Gray

Chief Geographer

JUL 17 1997

HYDROGRAPHIC SURVEY STATISTICS

H-10735

RECORDS ACCOMPANYING SURVEY: To be completed when survey is processed.

RECORD DESCRIPTION		AMOUNT	RECORD DESCRIPTION		AMOUNT
SMOOTH SHEET		1	SMOOTH OVERLAYS: POS., ARC, EXCESS		NA
DESCRIPTIVE REPORT		1	FIELD SHEETS AND OTHER OVERLAYS		NA
DESCRIPTION	DEPTH/POS RECORDS	HORIZ. CONT. RECORDS	SONAR-GRAMS	PRINTOUTS	ABSTRACTS/SOURCE DOCUMENTS
ACCORDION FILES	2				
ENVELOPES					
VOLUMES					
CAHIERS					
BOXES					

SHORELINE DATA					
SHORELINE MAPS (List): DM-10046 and DM-10051					
PHOTOBATHYMETRIC MAPS (List): NA					
NOTES TO THE HYDROGRAPHER (List): NA					
SPECIAL REPORTS (List): NA					
NAUTICAL CHARTS (List): 16701, 16th Ed., and 16705 16th Ed.					

OFFICE PROCESSING ACTIVITIES

The following statistics will be submitted with the cartographer's report on the survey

PROCESSING ACTIVITY	AMOUNTS			
	VERIFICATION	EVALUATION	TOTALS	
POSITIONS ON SHEET				
POSITIONS REVISED				
SOUNDINGS REVISED				
CONTROL STATIONS REVISED				
	TIME-HOURS			
	VERIFICATION	EVALUATION	TOTALS	
PRE-PROCESSING EXAMINATION				
VERIFICATION OF CONTROL				
VERIFICATION OF POSITIONS				
VERIFICATION OF SOUNDINGS				
VERIFICATION OF JUNCTIONS				
APPLICATION OF PHOTOBATHYMETRY				
SHORELINE APPLICATION/VERIFICATION				
COMPILATION OF SMOOTH SHEET	58.0		58.0	
COMPARISON WITH PRIOR SURVEYS AND CHARTS		4.0	4.0	
EVALUATION OF SIDE SCAN SONAR RECORDS				
EVALUATION OF WIRE DRAGS AND SWEEPS				
EVALUATION REPORT		44.0	44.0	
GEOGRAPHIC NAMES				
OTHER*				
*USE OTHER SIDE OF FORM FOR REMARKS	TOTALS	58.0	48.0	106

Pre-processing Examination by M. Bigelow	Beginning Date 6/17/97	Ending Date 6/23/97
Verification of Field Data by E. Domingo	Time (Hours) 58.0	Ending Date 12/10/97
Verification Check by B. Olmstead	Time (Hours) 4	Ending Date 1/9/98
Evaluation and Analysis by B. Mihailov	Time (Hours) 48.0	Ending Date 12/24/97
Inspection by B.A. Olmstead	Time (Hours) 7	Ending Date 1/15/98

EVALUATION REPORT

H-10735

A. PROJECT

The hydrographer's report contains a complete discussion of the Project information.

B. AREA SURVEYED

The survey area is adequately described in Section B of the hydrographer's report.

The hydrographer has determined the inshore limits of safe navigation by defining a Navigable Area Limit Line throughout the survey area. Charted features and soundings inshore of this limit line have not been specifically addressed during survey operations and should be retained as charted. Two page-size plots of the charted area depicting the limits of supersession accompanies this report as Attachment A and Attachment B.

The bottom consists mainly of green mud. Other components include broken shingles, broken shells and black sand. Depths range from 0 to 52 fathoms.

C. SURVEY VESSELS

The hydrographer's report contains information relating to survey vessels.

D. AUTOMATED DATA ACQUISITION AND PROCESSING

Survey data were processed using the same Hydrographic Data Acquisition/Processing System (HDAPS) software used by the hydrographer, the Hydrographic Processing System (HPS), and MicroStation 95.

Digital data for this survey exists in the standard HPS format, that is a database format using the .dbf extension. In addition, the plot is filed both in the MicroStation drawing format, i.e., dgn (extension), and in the more universally recognized graphics transfer format, .dxf (extension). Copies of these files will be retained at PHB until data forwarded to headquarters has been accepted and approved. Database records forwarded are in the Internal Data Format (IDF) and are in compliance with specifications in existence at the time of survey processing.

The drawing files necessarily contain information that is not part of the HPS data set such as geographic names text, line-type data, and minor symbolization. In addition, those soundings deleted from the drawing for clarity purposes remain unrevised in the HPS digital files to preserve the integrity of the original hydrographic data set. Cartographic codes used to describe the digital data are those authorized by Hydrographic Survey Guideline No. 35 and No. 75.

The field sheet parameters have been revised to center the hydrography on the office plot. The data is plotted using a Modified Transverse Mercator projection and are depicted on a single sheet.

E. SONAR EQUIPMENT

Side Scan Sonar equipment was used on survey H-10735 to investigate the charted 4 ¾ fathom sounding located at latitude 58/09/30N, longitude 134/21/58W. The hydrographer's report contains a complete discussion of this investigation. The data has been filed with the hydrographic records for survey H-10735.

F. SOUNDING EQUIPMENT

The hydrographer's report contains a discussion on sounding equipment.

G. CORRECTIONS TO SOUNDINGS

The sounding data have been reduced to Mean Lower Low Water (MLLW). The reducers include corrections for an actual tide, dynamic draft, and sound velocity. These reducers have been reviewed and are consistent with NOS specifications.

Predicted tides were used for reduction of soundings during field processing. During office processing, tide reductions were derived from approved hourly heights zoned direct from the following tide gages: Young Bay, Alaska, gage 945-2249 and Oliver inlet gage, 945-2184.

H. CONTROL STATIONS

Section H and I of the hydrographer's report contain adequate discussions of horizontal control and hydrographic positioning.

The positions of horizontal control stations used during hydrographic operations are published values based on NAD 83. The geographic positions of all survey data are based on NAD 83. The smooth sheet is annotated with an NAD 27 adjustment tick based on values determined with the NGS program NADCON. Geographic positions based on NAD 27 may be plotted on the smooth sheet utilizing the NAD 83 projection by applying the following corrections:

Latitude:	-1.194 seconds	(-36.927 meters)
Longitude:	6.349 seconds	(103.779 meters)

The year of establishment of control stations originate with the horizontal control records for this survey.

I. HYDROGRAPHIC POSITION CONTROL

Differential GPS (DGPS) was used to control this survey. A horizontal dilution of precision (HDOP) not to exceed 3.75 was computed for survey operations. The quality of several positions exceeds limits in terms of horizontal dilution of precision (HDOP). These positions are isolated and occur randomly throughout the survey area. A review of the data, however, suggests that none of these fixes are used to position dangers to navigation. The features or soundings located by these fixes are consistent with the surrounding information. These fixes are considered acceptable. DGPS performance checks were conducted in the field and found adequate.

NAD 83 is used as the horizontal datum for plotting and position computations.

Additional information concerning calibrations and system checks can be found in the hydrographer's report and in the separates related to horizontal position control and corrections to position data.

J. SHORELINE

Shoreline maps DM-10046 and DM-10051, scale 1:20,000 were compiled on NAD 83 and apply to this survey. Shoreline drawn on the smooth sheet originates from 1:20,000 scale digital files provided by the Coastal Mapping Program. The digitized files and the survey file were merged during MicroStation processing.

The were no MHW revisions on this survey.

K. CROSSLINES

Crosslines are discussed in the hydrographer's report.

L. JUNCTIONS

Survey H-10735 junctions with the following surveys:

<u>Survey</u>	<u>Year</u>	<u>Scale</u>	<u>Area</u>
H-10734B	1997	1:10,000	Western Limit
H-10737	1997	1:10,000	Eastern Limit

The junction with surveys H-10734B and H-10737 are complete; soundings and depth curves are in good agreement within the common area. A "Joins" note has been shown on the survey.

M. COMPARISON WITH PRIOR SURVEYS

H-1897	(1888)	1:80,000
H-1898	(1888)	1:10,000
H-1920	(1888)	1:30,000
H-1924	(1888)	1:10,000
H-2055	(1890)	1:40,000

The above prior surveys cover the entire area of the present survey. Differences in depths generally range from 1 to 2 fathoms. There is no consistent pattern in the depth changes between the prior surveys and the present survey. The differences may be attributed to greater sounding coverage, improved positioning and sounding techniques and relative accuracy of the data acquisition methods.

The following features were transferred to the smooth sheet in violet from prior survey H-1920.

<u>Feature</u>	<u>Latitude(N)</u>	<u>Longitude(W)</u>
ledge	58/09/10	134/21/25
ledge	58/09/35	134/23/15

With the exception of the above features, survey H-10735 is adequate to supersede the above prior surveys within the common area.

T-3682	(1917)	1:20,000
T-3849	(1921)	1:20,000

Numerous rocks charted along the shoreline originate from these prior shoreline maps. The shoreline has remained relatively stable and H-10735 compares well with the prior shoreline map. Prior features within the common area have been adequately addressed during survey operations.

Survey H-10735 is adequate to supersede the prior topographic maps within the common area.

H-4147WD	(1920-21)	1:40,000
H-4147a	(1920-21)	1:40,000

The above wire-drag survey covers the southern portion of the present survey. One wire-drag sounding, a charted 4 ¾ fathom grounding at latitude 58/09/29N, longitude 134/21/56W, originates from prior survey H-4147WD. Adequate sounding development and side scan sonar was accomplished to supersede the 4 ¾ fathom sounding. A least depth of 6.3 fathoms was found at latitude 58/09/33.499N, longitude 134/21/50.838W and is adequate to supersede the prior grounded depth. Refer to the hydrographer's report for additional information. All remaining wire-drag soundings and clearance depths have been adequately addressed. Refer to the hydrographer's report for additional information.

Survey H-10735 is adequate to supersede the prior wire-drag survey within the common area.

N. ITEM INVESTIGATIONS

There were no AWOIS items assigned to this survey. As previously discussed in section M, a 4 ¾ fathom sounding was investigated.

O. COMPARISON WITH CHART

Survey H-10735 was compared with the following charts:

<u>Chart</u>	<u>Edition</u>	<u>Date</u>	<u>Scale</u>	<u>Datum</u>
17300	27th	Aug. 14, 1993	1:209,978	NAD83
17315	21st	Aug. 3, 1991	1:40,000	NAD83
17316	16th	Jan. 5, 1991	1:80,000	NAD83
17316	17th	Jan. 5, 1991	1:80,000	NAD83

a. Hydrography

Charted hydrography originates with the previously discussed prior surveys and miscellaneous source data. The prior surveys have been adequately addressed in section M and require no further discussion.

The application of this survey to charts of a scale greater than 1:40,000 requires the generalization of features such as ledges, and reefs. The recommended charting disposition of specific ledges or reefs is their depiction as isolated rocks. The application of this survey to charts of a scale less than 1:40,000 may be accomplished without generalization of features.

Survey H-10735 is adequate to supersede charted hydrography within the charted area.

b. Dangers To Navigation

No dangers to navigation were discovered during survey operations.

No additional dangers to navigation were found during office processing.

P. ADEQUACY OF SURVEY

Hydrography contained on survey H-10735 is adequate to:

- a. delineate the bottom configuration, determine least depths, and draw the required depth curves;
- b. reveal there are no significant discrepancies or anomalies requiring further investigation; and
- c. show the survey was properly controlled and soundings are correctly plotted.

The hydrographic records and reports received for processing are adequate and conform to the requirements of the Hydrographic Manual, 4th Edition, revised through Change No. 3, the Hydrographic Survey Guidelines, and the Field Procedures Manual, April 1994 Edition.

Q. AIDS TO NAVIGATION

There were no features of landmark value located within the area of this survey.

Refer to the hydrographer's report regarding a discussion of prominent reference points which are located within the survey area.

R. STATISTICS

Statistics are itemized in the hydrographer's report.

S. MISCELLANEOUS

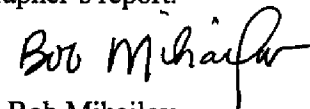
Miscellaneous information is discussed in the hydrographer's report. No additional miscellaneous items were noted during office processing.

T. RECOMMENDATIONS

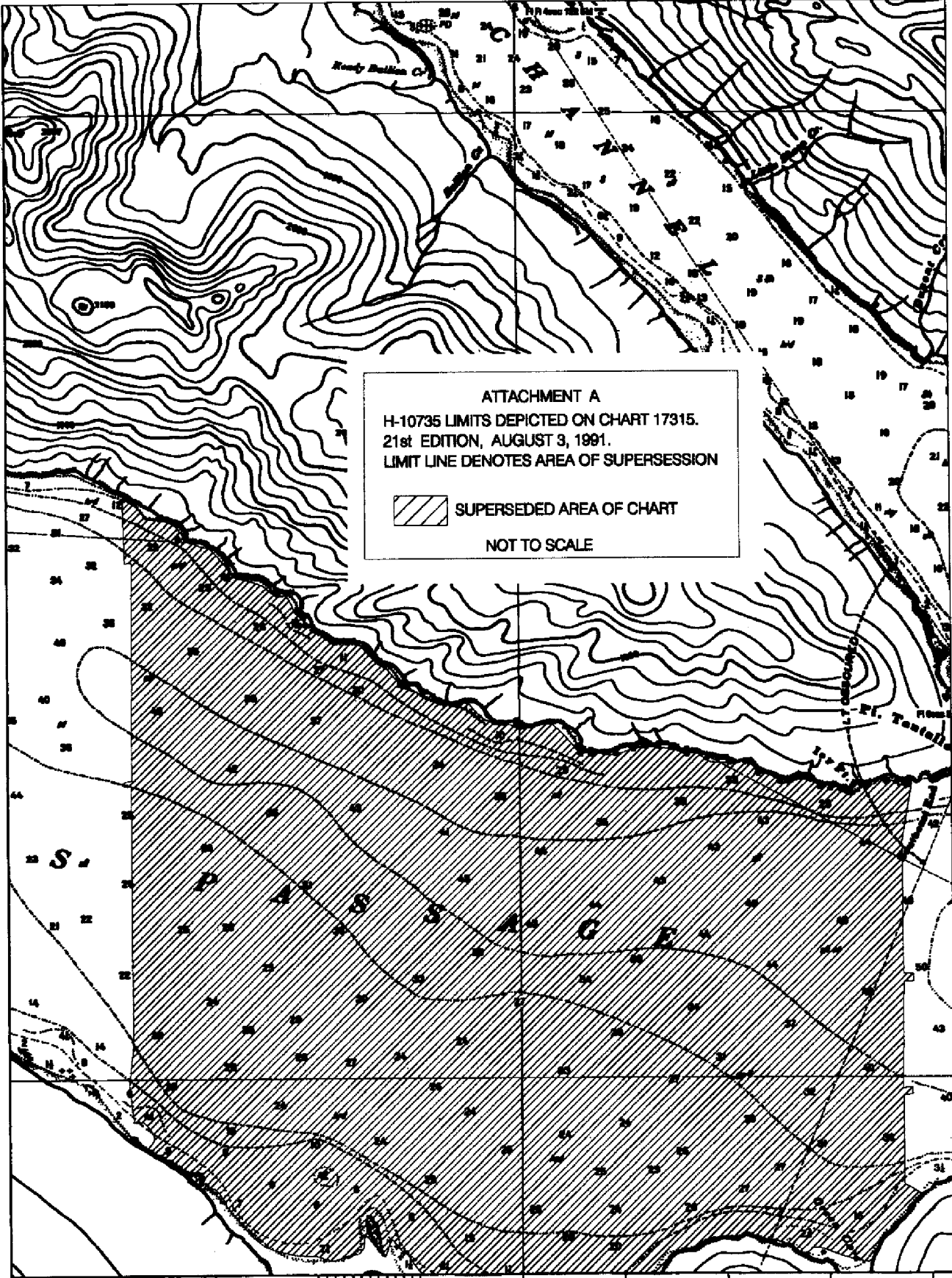
This is a good hydrographic survey. No additional work is recommended.

U. REFERRAL TO REPORTS


Referral to reports is discussed in the hydrographer's report.



Bob Mihailov
Cartographer



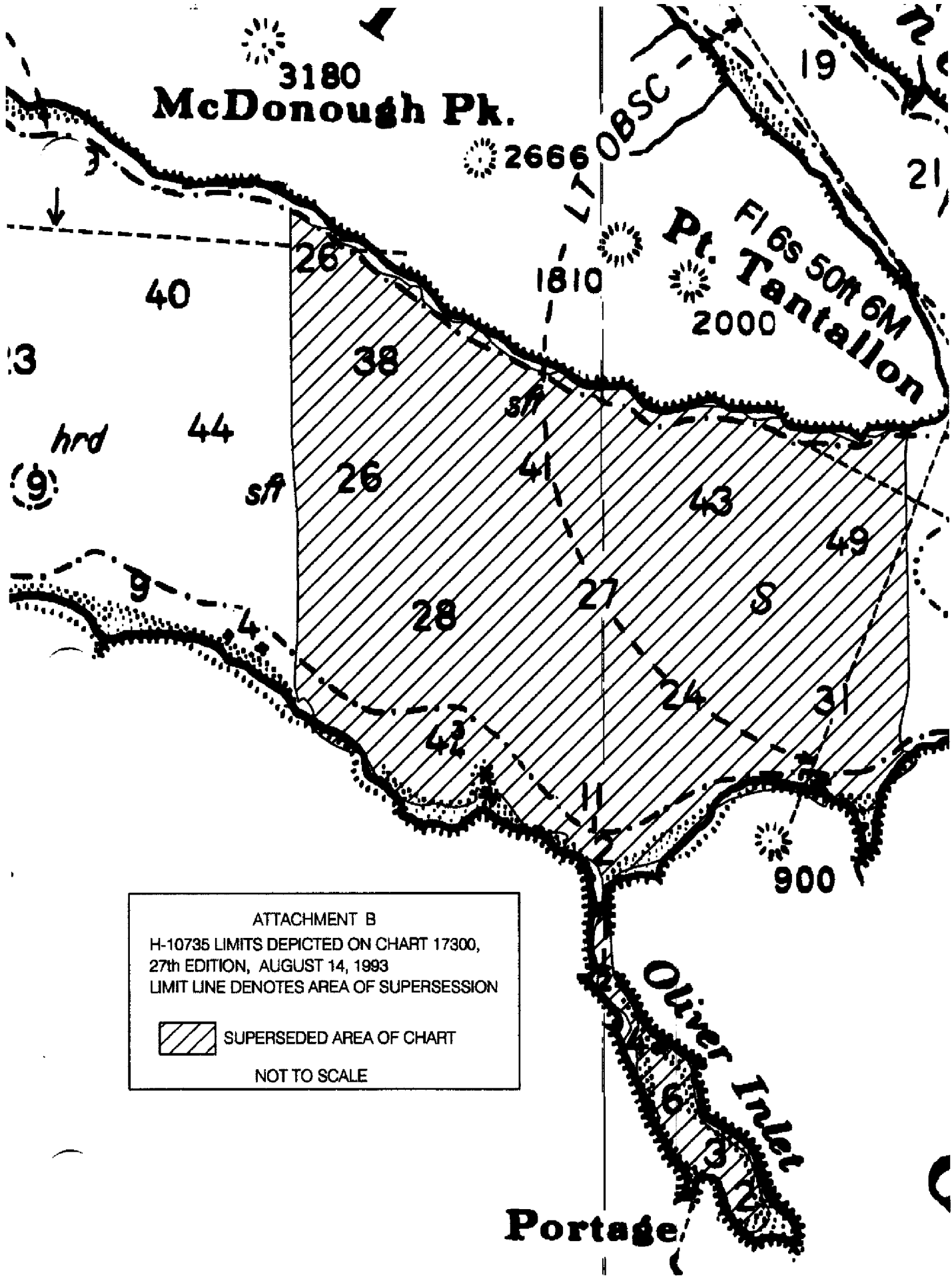
ATTACHMENT A
H-10735 LIMITS DEPICTED ON CHART 17315.
21st EDITION, AUGUST 3, 1991.
LIMIT LINE DENOTES AREA OF SUPERSESSION

 SUPERSEDED AREA OF CHART


NOT TO SCALE

22° 47' 30" 21' 20" CONTINUED ON CHART 17301

Published at Washington, D.C.
U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SERVICE



ATTACHMENT B
 H-10735 LIMITS DEPICTED ON CHART 17300,
 27th EDITION, AUGUST 14, 1993
 LIMIT LINE DENOTES AREA OF SUPERSESSON

 SUPERSEDED AREA OF CHART

NOT TO SCALE

Portage

APPROVAL SHEET
H-10735

Initial Approvals:

The completed survey has been inspected with regard to survey coverage, delineation of the depth curves, development of critical depths, cartographic symbolization, comparison with prior surveys and verification or disapproval of charted data. The survey records and digital data comply with NOS requirements except where noted in the Evaluation Report.

Bruce A. Olmstead Date: 1/20/98
Bruce A. Olmstead
Senior Cartographer, Cartographic Section
Pacific Hydrographic Branch

I have reviewed the smooth sheet, accompanying data, and reports. This survey and accompanying digital data meet or exceed NOS requirements and standards for products in support of nautical charting except where noted in the Evaluation Report.

Kathy Timmons Date: 1/28/98
Kathy Timmons
Commander, NOAA
Chief, Pacific Hydrographic Branch

Final Approval

Approved:

Andrew A. Armstrong III Date: 25 Mar 98
Andrew A. Armstrong III
Captain, NOAA
Chief, Hydrographic Surveys Division

